What is claimed is:

1. An optical fiber strain sensor device, comprising;

an FBG sensor including an optical fiber having an FBG written therein and mounted on an object to be measured, a broadband light source for directing a broadband light ray to the FBG sensor, and a filter that reflects or transmits a light ray reflected from the FBG sensor,

wherein, using the filter, the optical fiber strain sensor device detects a strain by detecting a change in a center wavelength of the light ray reflected from the FBG sensor.

2. An optical fiber strain sensor device, comprising; an FBG sensor mounted on an object to be measured, a broadband light source for directing a broadband light ray to the FBG sensor, and a filter that both reflects and transmits a light ray reflected from the FBG sensor,

means for detecting a change in the wavelength of the light ray reflected from the

FBG sensor or a change in the strain of the FBG sensor, including means for detecting an amplitude change in a signal that is obtained by inverting the phase of one of: (a) a signal representative of the light ray reflected from the filter and (b) a signal representative of the light ray transmitted through the filter, and then adding the inverted and non-inverted signals to each other.

3. An optical fiber strain sensor device according to claim 1, wherein the FBG sensor and the broadband light source are connected to each other through an optical circulator, and wherein the FBG sensor and the filter are connected to each other through the optical circulator

4. An optical fiber strain sensor device according to claim 1, wherein the FBG sensor and the broadband light source are connected to each other through a first optical circulator, and wherein the FBG sensor and the filter are connected to each other through a second optical circulator.

5. An optical fiber strain sensor according to claim 1, wherein the filter is an FBG filter or a dielectric multi-layer filter.

6. An optical fiber strain sensor according to claim 2, wherein the filter is an FBG filter or a dielectric multi-layer filter.

7. An optical fiber strain sensor according to claim 2, wherein said means for detecting includes first and second photoelectric conversion devices for receiving, respectively, light rays reflected from and transmitted through said filter, and signal processing apparatus for inverting the phase of an output of a selected one of said photoelectric conversion devices, combining the inverted and non-inverted outputs, and measuring at least one characteristic of the combined outputs.

8. A strain detection method using an optical fiber strain sensor device, wherein an FBG sensor including an optical fiber with an FBG written therein is mounted onto an object to be measured, a broadband wavelength light ray is made incident on the FBG sensor,

a light ray reflected from the FBG is made incident on a filter, and using the filter, measuring a variation in the center wavelength of the light ray reflected from the FBG sensor, said variation being in proportion to a strain sensed by the FBG sensor, to thereby detect a change in the strain of the FBG sensor.

9. A strain detection method using an optical fiber strain sensor device, wherein an FBG sensor including an optical fiber with an FBG written therein is mounted onto an object to be measured, a broadband wavelength light ray is made incident on the FBG sensor, a light ray reflected from the FBG sensor is made incident on a filter, and the optical fiber strain sensor device detects a strain change sensed by the FBG sensor by summing the light ray reflected from the filter and the light ray transmitted through the filter with one of the light rays inverted in phase, the light ray reflected from the filter and the light ray transmitted through the filter changing in mutually opposite phase with respect to a change in the light ray reflected from the FBG, and detecting an amplitude change in the sum.